

To: Matt Francis[m.francis@erllc.com]
Cc: Way, Steven[way.steven@epa.gov]; Allen Sorenson - DNR[allen.sorenson@state.co.us]
From: Mark Levin
Sent: Tue 9/1/2015 3:07:11 AM
Subject: portal support
[4376_001.pdf](#)
[4377_001.pdf](#)

Hi Matt:

See attached and below. This is from a recent past project – was half the cost of steel sets. A smaller cross section could possibly work for the new Gold King bypass adit portal suggestion.

This structure (and also steel sets) requires a competent footer so that the load from the structure does not exceed the soil bearing capacity, or the structure can be pushed into the soil. Steel skid beams, or even something more substantial, may be required for a footer.

Bearing capacity of ground below should be determined before any support structure is installed (this comment also applies to the old portal area...). This lesson was something I learned the hard way, a long time ago.

Have a good night,

Mark Levin, P.E.

General Manager

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From: Rankin, Seth [mailto:SRankin@conteches.com]
Sent: Tuesday, July 21, 2015 10:46 AM
To: Mark Levin
Cc: Sledge, Phillip
Subject: Chicago Adit Multiplate Custom Shape Option

Mark,

We were able to work up a custom shape to meet the needs of your clearance box. The curvature at the top of the clearance box does not encroach on the clearance area any more than the steel sets do. See the attached sketch. Assuming that the maximum height of fill from invert to top of grade along the 40' of this structure will be 35', you will have about 21' of cover maximum. With 21' of cover we recommend an 8 gage material. This material thickness is based on the height of cover and does not take into account anything like wind load or snow load (although these may be less than the load inflicted by the 21' of cover anyways). It also was not chosen for a specific impact from falling rock since this criteria is not known.

Also, see the sketch concerning the finished grade around the portal that one of our plate engineers drew up. He thought that it might be good to run this option by you in case it could be a better option for you with the fill. Doing something like what is shown adds an extra layer of protection to the structure. Also, what kind of bearing capacity do you think you will be able to achieve in the field? Are you on rock? A concrete foundation could potentially be fairly wide if you are on bad soils.

Estimate below includes 40 LF of 141 Pi Multiplate 2-radius arch. Material thickness = 8 gage. Max cover = 21'. Estimate does NOT include any installation or foundation work.

- Estimate = \$28,367.00 (delivered to jobsite)

Let Phil or myself know if you have any questions,

Seth Rankin

Bridge Consultant

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